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Applicant	:	J. Carl Cooper
Appl. No.	:	08/824,496
Filed	:	03/14/1997
Title		Improved IFB System Apparatus and Method
Grp./A.U.	:	2644
Examiner	:	Minsun Oh Harvey
Docket No.	:	JCC-396A

October 17, 2002

Honorable Commissioner for Patents
Washington, D.C. 20231

Via Fax # (703) 872-9314

Noted
MSO
5/28/03

APPEAL BRIEF

REAL PARTY IN INTEREST:

Applicant

RELATED APPEALS AND INTERFERENCES:

None

STATUS OF CLAIMS:

Claims 1 and 4 to 9 are rejected under 35 U.S.C. § 112, second paragraph.

Claim 19 appears to be rejected under 35 U.S.C. § 112, second paragraph.

Claims 2, 3, 4-7, 18, 19, 20-22, 23-27, 29, 31, 37 and 38 are rejected under 35 U.S.C. § 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)) as being anticipated by Umemoto et al. 5,636,323 (Umemoto).

Claim 30 may be rejected under 35 U.S.C. § 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)) in view of Umemoto et al. 5,636,323.

Claims 2, 3, 4-7, 10, 11 and 16-18 are rejected under 35 U.S.C. § 102(b) as being anticipated by Agrawal et al. 4,268,727 (Agrawal).

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Claims 8-17, 28 and 32-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Umemoto considered with the publication to Kuo et al. "Active Control Systems" pp 35-36 (Kuo).

Claims 1-17, 40, 41 and 43-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanno, JA 0170298 (Tanno) considered with Davidson 4,025,724 (Davidson) and Kuo.

Claims 18, 42 and 48-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanno, Davidson, Kuo combination further considered with either of Agrawal, Umemoto or alternatively either of Agrawal or Umemoto considered with Davidson.

STATUS OF AMENDMENTS:

All amendments have been entered with no amendments pending.

SUMMARY OF INVENTION:

The invention is for an improved IFB (Interrupted Feed Back) system, a particular type of audible communications via electronic signals used primarily by radio and television stations. In on site television reporting (for example live news stories), the on site reporter receives an audio signal (in an earpiece or headset) from the television station which audio is a mixture of the program audio which the station is broadcasting as well as instructions from the television director (who is located in the station). Note that Interrupted Feed Back, IFB and program are terms have particular meaning to one of ordinary skill in the art as described in more detail in the present specification. This IFB signal typically is sent from the station to the reporter via cell phone or radio transmission. A typical instruction from the director might be given during a commercial to alert the reporter to get ready to come back live with his/her report at the end of the commercial. The reporter then listens to the commercial audio to determine when the commercial ends and thus when to start the report. This ability to hear both the program audio as well as the director's instructions is a key nature and

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characteristic of IFB systems which sets them apart from other point to point communications such as cellular and mobile telephone.

This IFB communication is unique as compared to usual person to person communications. The reasons for this uniqueness include the fact that the communications involve a live reporter whose primary focus and obligation is to provide a professional presence to the television or radio audience during their report. This professional presence prevents the reporter's full attention from being given to the communications with the director, or the program audio and at times requires simultaneously listening to the director's instructions and program audio while talking on the air to the broadcast audience. In short, IFB communications is totally unlike a simple phone call.

An unfortunate consequence of a typical prior art IFB system used in remote broadcasting is that as soon as the reporter starts talking to give the report, his/her voice (which is then being broadcast) is directed back to the reporter via the IFB. This audio is often delayed by a considerable amount. Hearing their own voice delayed is very disconcerting and often causes the reporter's presentation to the broadcast audience be upset, or causes the reporter to remove the IFB headphone thus losing the ability to hear instructions from the director.

The present invention is a novel apparatus and method for providing a mix minus signal from the program signal. In the preferred embodiment the invention removes the reporter's delayed voice from the IFB signal thus preventing the disconcerting presence of their delayed voice. Note that in the preferred embidiment of the present invention there are three communications signals involved, the director's instructions from the station to the reporter, the reporter's audio which is sent back to the station, and the program audio which includes the reporter's voice which is sent from the station to the reporter. The preferred embodiment of the invention operates by receiving the reporter's voice directly from the reporter's microphone (local voice), delaying that local voice signal to match the delay of the voice which is returned via the IFB signal, and combining the delayed local voice with the IFB signal to reduce or cancel out the reporter's delayed voice in the IFB signal. Manually adjustable or

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variously automatically adjusted embodiments of the invention are taught, along with other novel features which may be utilized with the invention.

The present invention differs from normal cellular and mobile telephone communications systems due to the differing field of art for the two. In addition, even if the two were compared, a substantial difference exists. In mobile phone systems an unwanted echo can develop in the opposite end of the communications where the voice from one party is coupled in the other party's phone from the earpiece (or speaker) to the microphone. Mobile phones intend to remove the unwanted voice echo (which takes place at the opposite end of the two way communications). For example, if a reporter talks to a director via mobile phone, in the director's phone the reporter's voice couples from the earpiece to the microphone causing an echo of the reporter's voice which would otherwise (without echo cancellation) return back to the reporter. The telephone system echo cancellation circuitry removes the reporter's voice from the director's voice being sent back to the reporter. This removal takes place at the director's end of the conversation, where the earpiece to microphone coupling occurs.

In the mix minus and IFB systems of the present invention, the reporter's voice is intended to be present in the program material for broadcast. Removing the reporter's voice from the program material at the broadcast station (or elsewhere) would defeat the purpose of the programming. Additionally, when the program material with the reporter's voice is sent back to the reporter's location, this allows the cameraman and others who work along side of the reporter to hear the reporter's voice to verify that the reporter's voice is properly mixed in the program. When the director's instructions are included in signal sent back (IFB), both the director's instructions and the reporter's voice can be heard.

In the present invention the reporter's voice is intended to be left in the program material which is broadcast. The broadcast program (usually along with the director's voice instructions) is returned to the reporter by whatever method is desirable. In the preferred embodiment, the reporter's voice is removed from the combination of the program material (and director's instructions) before that combination is supplied to the reporter. This distinction is brought out in the claims when properly interpreted as

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they would be known to one of ordinary skill in the art from the teachings of the specification.

Of particular note is the teachings and claiming of the invention using terms having specific meaning to those of ordinary skill in the art, the radio and television broadcast industry, such as program, mix minus signal, delayed feedback signal and talent signal.

ISSUES:

1) Whether Claims 1 and 4 to 9 are unpatentable under 35 U.S.C. § 112, second paragraph.

2) Whether Claim 19 is unpatentable under 35 U.S.C. § 112, second paragraph.

3) Whether Claims 2, 3, 4-7, 18, 19, 20-22, 23-27, 29, 31, 37 and 38 are unpatentable under 35 U.S.C. § 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)) as being anticipated by Umemoto et al. 5,636,323 (Umemoto).

4) Whether Claim 30 s unpatentable under 35 U.S.C. § 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)) in view of Umemoto et al. 5,636,323.

5) Whether Claims 2, 3, 4-7, 10, 11 and 16-18 are unpatentable under 35 U.S.C. § 102(b) as being anticipated by Agrawal et al. 4,268,727 (Agrawal).

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6) Whether Claims 8-17, 28 and 32-36 are unpatentable under 35 U.S.C. 103(a) as being unpatentable over Umemoto considered with the publication to Kuo et al. "Active Control Systems" pp 35-36 (Kuo).

7) Whether Claims 1-17, 40, 41 and 43-47 are unpatentable under 35 U.S.C. 103(a) as being unpatentable over Tanno, JA 0170298 (Tanno) considered with Davidson 4,025,724 (Davidson) and Kuo.

8) Whether Claims 18, 42 and 48-53 are unpatentable under 35 U.S.C. 103(a) as being unpatentable over Tanno, Davidson, Kuo combination further considered with either of Agrawal, Umemoto or alternatively either of Agrawal or Umemoto considered with Davidson.

9) Whether the examiner has established a proper record supporting the rejections above under 37 C.F.R. 1.104 and in particular 37 C.F.R. 1.104©(2), las t sentence.

GROUPING OF CLAIMS:

The claims will stand together if the common claim elements described below are given their proper meaning, however each claim falls alone due to the several different limitations therein.

ARGUMENT:

ARGUMENTS PERTINENT TO ALL CLAIMS

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Attention is called to Applicant's declarations of October 3, 2001 and September 9, 2002, which declarations were submitted with the October 3, 2001 response and September 9, 2002 request for reconsideration respectively.

On November 27, 2001 applicant filed a Notice Of Appeal, as well as an Appeal Brief. In an office action dated 6/05/02 the examiner acknowledged the Appeal Brief filed 11/27/01 and stated Prosecution was reopened in this case with the office action of 3/04/02.

REQUEST FOR RECONSIDERATION

Applicant filed a Request for Reconsideration on September 9, 2002, along with the above mentioned declaration. The request for reconsideration succinctly summarizes many of the improper claim interpretations used in the rejections. Portions of the Request for Reconsideration are repeated below.

DIFFERING FIELDS OF ART

The present invention pertains to an entirely different field of art than those of the cited references. Applicant's field of art utilizes specific terms of art which are found and identified in the specification and used in the claims. These terms give meaning to the scope and limitations of the claims. It is believed that a person of ordinary skill, at the time of the invention, would not look to the fields of the presently cited prior art to achieve the claimed invention, nor would the person of ordinary skill interpret the claim language, and in particular the terms of art and those terms having specialized meaning as being met by elements of the cited art. These differences are discussed in more detail below.

The examiner has not provided any support or reasoning which would cause the person of ordinary skill in the industry to which the present invention pertains (as set forth for example in the Field of the Invention "... audib ly communicating with remotely located actors and reporters in radio and television systems") to look to the presently cited prior art which pertains to different fields of art (for example point to

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point communications such as the telephone system of Agrawal and the mobile telephone system of Umemoto), to achieve the claimed invention.

The claimed invention provides a mix minus signal as specifically claimed in each claim. Mix minus signal is a term having particular meaning in the field of art to which the invention pertains and which is specified in the disclosure. The person of ordinary skill in the art would know "mix minus signal" to be the approximation of the program signal without the talent signal. The term "program signal" would be known to the person of ordinary skill to pertain to a mixture of electronic signals including the talent signal in recorded or broadcast productions of television and radio like programs. See Cooper 9/9/02 Declaration paragraph 14.

The person of ordinary skill in the art would know that telephone systems such as those described in the cited art do not provide mix minus signals or operate with program signals. In the Umemoto and Agrawal inventions the purpose is to reduce unwanted echoes in point to point communications between two people. There is no use of broadcast or recorded program signals and no need to remove a talent signal or other desired signal from a broadcast or recorded program signal for such use. For example, if as the examiner supposes, one of the people in the two way phone conversation is considered to be the talent, removing the talent signal effectively removes one side of the phone conversation. Such modification of the cited art defeats its purpose and would teach away from the use of that art, even if it were in the same field. The purpose and intent of the two arts are inconsistent and applicant finds no suggestion in the references at hand to apply them to the field of the present invention.

Applicant notes the claims have been allowed over much more pertinent prior art, Kirby et al, GB 2269968 which is used in the same field of art and is intended to be used in the same application as applicant's invention (but achieves a different result in a different way with a different structure). In this respect the present references are much less pertinent that Kirby.

112 REJECTIONS

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With respect to the 112 rejections, applicant points out that the language of Claims 1, 4-9 and 19 concerning manual and automatic adjustment of delay is not inconsistent. It is believed that the present rejection is based on a misreading or misunderstanding of the independent claims or misunderstanding of specific features of the invention.

The invention may very well be configured in an embodiment which uses both manual and automatic adjustment. For example the invention may be practiced with automatic adjustment to track changes of delay and/or gain occurring in the feedback signal, as well as manual adjustment to provide a small amount of talent's voice in the mix minus signal (i.e. less than full cancellation) as described at the bottom paragraph of page 13 and the middle paragraph of page 20. This feature of the invention is specifically recited in the middle paragraph of page 12 "[a] further feature of the invention allows for adjusting the level of compensation according to the amount of delay and/or the talent's preferences." Accordingly there is nothing inconsistent with the recitation of human operator adjustment of gain or delay in claim 1 and automatic adjustment of gain and/or delay in the dependent claims. Refer to Cooper 9/9/02 declaration paragraphs 16-19.

102 AND 103 REJECTIONS

Applicant's claims utilize terms which are terms of art having particular meaning to persons of ordinary skill in the art and are accordingly pointed out and/or defined in applicant's specification. Terms of art which would be known to the person of ordinary skill as of the filing date of the application include "director", "program" or "program signal", "program audio" and "interrupted feed back" and its abbreviation "IFB". See Cooper 9/9/02 Declaration paragraphs 6-9. Applicant, choosing to be his own lexicographer, has specifically defined other terms in the specification. These terms include: "feedback signal", "talent", "talent signal", "mix minus" and "mix minus signal" and "cancellation signal". See Cooper 9/9/02 Declaration paragraphs 10-15.

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The claims at issue utilize one or more of these terms of art or specially defined terms. In particular, all of the claims use the term "mix minus signal" which the person of ordinary skill in the art would know from the teachings of the present invention to be a special signal including program audio with the talent's voice removed or reduced. The person of ordinary skill in the art would know that none of the signals which occur in telephone systems of the type described in the present prior art are "mix minus signals" as that term is used in the claims.

With respect to the rejections over Umemoto, a person of ordinary skill in the art would not apply the cited prior art to the claims as has been done in the rejections of the last office action. Umemoto is used in speech communications in hands free mobile telephone systems.

The claim term "talent signal" would not be considered by a person of ordinary skill to be the signal RS of Umemoto. The "talent signal" as used in the claims is a signal intended to be mixed with other electronic signals to make a program signal or feedback signal. See Cooper 9/9/02 Declaration paragraphs 12 and 13. The examiner refers to Umemoto's EC as the feedback signal, but RS is not mixed with other signals to provide EC, thus while RS may come from a human voice, RS does not fall within the meaning of, and thus can not be the "talent signal" of the claims. See Cooper 9/9/02 Declaration paragraphs 20-22. The examiner does not identify any program signal in Umemoto and since Umemoto's invention is used in telephone systems, there generally are only two people talking in a conversation rather than having a program signal which is broadcast.

The special claim term "feedback signal" would not be considered by a person of ordinary skill to be the acoustic feedback signal EC of Umemoto. The claimed "feedback signal" is a specially defined electronic signal similar to the program or IFB signal. See Cooper 9/9/02 Declaration paragraphs 10 and 11. Umemoto's EC is an acoustic signal, not an electronic signal. EC is also not a mixture of electronic signals including the talent signal (which the examiner equates to RS) and it is not recorded or broadcast (program signal). See Cooper 9/9/02 Declaration paragraph 7. EC is also not an audio signal taken from the program audio and including comments from the

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director (IFB). See Cooper 9/9/02 Declaration paragraph 9. EC is merely the acoustic version of RSS which in turn is merely the volume adjusted (36) and limited (35) version of RS which the examiner equates to the talent signal. See Cooper 9/9/02 Declaration paragraphs 20-22.

The claim term "mix minus" would not be considered by a person of ordinary skill to be equivalent to Umemoto's ESS signal. The mix minus signal of the claims is the approximation of the program signal without the talent signal. See Cooper 9/9/02 Declaration paragraph 14. Umemoto's ESS signal is a filtered (by 31) version of the RSS signal which in turn is a limited and gain adjusted version of the RS signal. See Cooper 9/9/02 Declaration paragraph 23. The examiner has equated the signal RS to the talent signal, thus if RS is considered to be the talent signal, ESS would be a filtered version of the gain adjusted and limited talent signal. Stated another way, ESS would be a version of the talent signal, not the claimed mix minus signal which is an approximation of the program signal without the talent signal (i.e. with the talent signal missing or substantially reduced)..

For each of the claim terms which the examiner has likened to a claim element, i.e. talent signal to RS, feedback signal to EC and mix minus signal to ESS, serious and substantial differences exist between the claim element and the examiner's prior art signal. The person of ordinary skill would know such differences to prevent such correspondence and accordingly the person of ordinary skill would not view Umemoto as anticipating or obviating the rejected claims, either alone or in combination with the other art as cited.

With respect to the rejection over Tanno, considered with Davidson and Kuo, Tanno is a feedback (howling) cancellation device. Applicant finds no suggestion in Tanno that would lead one of ordinary skill in the art to consider Tanno for use in the field of art of the present invention. Tanno does not appear to show or suggest any program signal (a mixture of electronic signals including the talent signal) and thus no mix minus signal (the approximation of the program signal without the talent signal) or feedback signal (program or IFB like signal fed back to the talent). See Cooper 9/9/02 Declaration paragraphs 7-14.

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The examiner points to the talent as the person speaking into the mic M1 and the feedback signal as the signal entering M2 which was broadcast by S1. The claimed feedback signal is an electronic signal, whereas the signal entering M2 is an acoustic signal. If the feedback signal is considered to be the electronic signal out of M2, it is not delayed as called for in the rejected claims, since the delay pointed to by the examiner takes place with respect to the acoustic signal from S1 to M2. It may be noted that while there is a definite acoustic delay in Tanno, that delay is substantially smaller than the delays the present invention deals with.

The examiner points to T2 as a combining circuit, however Tanno describes T2 as an "attenuating circuit". One of ordinary skill in the art would know the attenuating circuit would operate to adjust the level of the signal from M2, not to combine the signal from D1 with the signal from M2. See Cooper 9/9/02 Declaration paragraphs 24 and 25.

There is no combination of the signal from M1 with the signal from M2, thus Tanno does not meet the language of any of the rejected claims as the examiner states. The combination of Tanno and the other cited art does not cure or suggest curing this shortcoming.

With respect to Kuo, applicant notes that Kuo was apparently the first edition which was published some time in 1996 whereas the present application receives priority from provisional application 60/013,545 filed 03/14/96. Applicant has requested explanation of the effective date of Kuo if it is available, but has received no response.

With respect to the combination of Tanno, Davidson, and Kuo in further view of Agrawal or Umemoto, or alternatively Agrawal or Umemoto considered with Davidson, these combinations fail for the reasons given above, explained in further detail below..

ARGUMENTS WITH RESPECT TO PARTICULAR CLAIM REJECTIONS

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35 U.S.C. § 112

The examiner has rejected claims 1 and 4-9 under 35 U.S.C. § 112 stating "Claims 1 and 19 require that both delay and gain be automatically adjusted, whereas the parent claim requires that either delay or gain is human operator adjustable". Applicant notes that the independent claim 1 actually recites "with the amount of said delay or gain responsive to human operator adjustment". Claim 1 does not recite either delay or gain adjustment as the examiner states in the rejection. Claim 1 thus could cover a system where the delay is operator adjusted, or the gain is operator adjusted or where both the delay and gain are operator adjusted. The dependent claims are not inconsistent with the language of the independent claim.

35 U.S.C. § 102(e)

The examiner rejects claims 2-7, 18-27, 29-31, 37 and 38 under 35 U.S.C. 102(e) in view of Umemoto et al. The examiner notes that the talent signal is RS and the Feedback signal is EC. Umemoto is a distinctly different device than that claimed and utilizes distinctly different signals for distinctly different purposes.

Umemoto's feedback signal is an acoustic feedback signal (i.e. sound), that travels through the air from the mobile telephone speaker 13 to the microphone 14. Such feedback is a common cause of unpleasant echo, or even howling, squeals and screeching in hands free telephone systems. Applicant's particularly defined feedback signal of the claims is not the same feedback signal which is addressed by the Umemoto invention. Applicant notes that the howling preventing system of Tanno is also aimed at removing the Umemoto type of feedback.

Umemoto is an echo canceller circuit which is useful the art of mobile telephone systems (col. 1, l. 11-24). Applicant's invention is used in an IFB environment in a broadcasting type system. Note in Figure 2 that Umemoto's invention operates to process (with ADF 31) a portion of the volume adjusted

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(36) and limited (37) received signal (RS) and subtract that processed signal (from 31) from the outgoing microphone signal ES in 32. Simply stated the received signal RS is being cancelled from the transmitted microphone (which the examiner likens to the talent) signal TS to cancel the acoustic feedback signal EC out of ES.

By contrast, in applicant's invention of the rejected claims, a portion of the talent signal is combined with the feedback (received) signal to cancel the delayed talent portion which is present in the feedback signal.

Applicant points out that applicant's feedback signal is particularly defined in applicant's disclosure in relation to the term of art IFB meaning Interrupted Feed Back (for example page 1, lines 3-6, page 2, lines 21 & 22). This signal is referred to in the disclosure when defining the "feedback signal" at page 3, last line through page 4, line 15. Applicant's claimed feedback signal is a combination of program material and talent signal and the invention operates to provide a mix minus signal in response thereto. In the usual system of the preferred embodiment, the talent signal is sent from a reporter's remote location to the broadcasting station where it is delayed, combined with the program material and returned (via broadcast transmitter or otherwise and further delayed) to the reporter's location. The invention operates to remove the talent signal from the delayed feedback signal to provide the mix minus signal which is primarily the delayed program material from the feedback signal. It is important to note that the preferred embodiment starts with delayed feedback (delayed program and delayed talent) and undelayed talent signal to provide delayed program (without the delayed talent). None of this happens in the cited art.

According to the examiner's interpretation RS is the talent signal which is most likely delayed in the transmission to the device, the feedback signal is identified as EC (which has no program content) which the examiner recognizes is undelayed. The examiner points to 31 as providing the cancellation signal, but 31 is responsive to the (presumably) already delayed talent signal RS. The

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examiner's feedback signal consists only of the talent signal RS which has been volume adjusted (36) limited (35) and converted to sound (11 & 12).

The difference between applicant's claims and Umemoto is clear. Claim 1 for example calls for providing a cancellation signal in response to the relatively undelayed talent signal and applying the cancellation signal and the delayed feedback signal to a combining circuit to provide the mix minus signal, i.e. the delayed program material from the feedback signal with the delayed talent signal substantially reduced or removed. According to the examiner's configuration of Umemoto the undelayed feedback signal is coupled to the combining circuit to completely remove the feedback signal. There is no program signal or mix minus signal.

Assuming arguendo Umemoto's signal EC corresponds to the claimed feedback signal and RS corresponds to the claimed talent signal as the examiner suggests, where is the program material in EC? The feedback signal EC of Umemoto is not a delayed combination of talent signal program material as is taught in the instant specification, rather it is only the volume adjusted (36) and limited (35) audible version of RS. Further, the signal RS is not a talent signal as taught in the instant specification but is rather the received signal in a mobile telephone system.

The feedback EC is not applied to any combining circuit with a cancellation signal responsive to the relatively undelayed talent signal resulting in the claimed mix minus signal which in the art and as taught in the instant specification is known to be the delayed program material with the talent signal removed or reduced. If 32 is assumed to be the combining circuit, it receives only the feedback signal EC (which has no program material) and the RSS signal via 31. This signal from 31 is only the feedback portion of RS, that is it is intended to match EC so that complete cancellation of the signal EC takes place in 32. There is no program signal in either RS or the resulting TS. Even if there were some content in RS considered to be program content and resulting in program content in EC, all of the program content will be canceled by 32. If the

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signal from the microphone 14 is considered to be the program signal then it is not delayed and the talent signal RS is not relatively undelayed.

Viewed another way, Claim 1 calls for the combining circuit to provide a mix minus signal which is taught to be delayed program material with most or all of the delayed talent signal removed. Under any reasonable interpretation of Umemoto the resulting signals ESS and TS do not correspond to the claimed mix minus signal, i.e. delayed program material with little or no delayed talent signal, which is provided by the claimed combining circuit (32).

35 U.S.C. § 102(b)

Claims 2-7, 10, 11 and 16-18 were rejected under U.S.C. 102(b) as anticipated by Agrawal "using a similar analysis to that used" for Umemoto. Agrawal is an echo canceller used in a telephone system. Looking to Figure 1, it is seen that the system shown is symmetric about the digital switch matrix 10. Looking to the left side, the only signal which could correspond to the talent is the transmit signal 12 from the microphone of A. The only elements which could correspond to the claimed combining circuit are 30 and 50. The element 50 does not respond to the talent signal as claimed. Element 30 is responsive to what the examiner considers the talent signal and a filtered version of the received signal Xa to remove the received signal Xa from the talent signal. Thus the talent signal is not removed or canceled in 30 as claimed, it is passed. In claim language terms, 30 does not provide a mix minus signal.

35 U.S.C. § 103(a)

Claims 8-17, 28 and 32-36 were rejected under U.S.C. 103(a) as being unpatentable over Umemoto considered with Kuo. Because of the differences between the claims and Umemoto as discussed above, the combination also fails to meet the claim language. Further, although Kuo does describe a "Correlation LMS Algorithm" there is no suggestion found in Kuo or Umemoto to use Kuo to provide the claimed correlation features. Although applicant agrees that Kuo

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does point to and teach a particular textbook example of correlation, applicant disagrees with the characterization of Kuo as providing either suggestions or enabling teachings of the various claim elements in combination as suggested in the office action. For example, the examiner states "correlation is just a type of comparison, and comparison is a type of correlation". Applicant disagrees in that this broad sweeping statement is neither taught or suggested by Kuo or Umemoto, and further that it is a statement which is not in context with the claim elements. There are many types of comparisons and correlations and without further context the statement fails to point to any teaching in the art which renders any of the particular combinations of claim elements anticipated or obvious.

Claims 1-17, 40, 41 and 43-47 were rejected under U.S.C. 103(a) as being unpatentable over Tanno considered with Davidson and Kuo. As pointed out above, Tanno is similar to Umemoto in that it reduces squealing from acoustic feedback.

The examiner points to T2 as being the claimed combining element, and M1 the talent signal. The cancellation signal is provided by D1, thus the other signal which is coupled to T2 must be the feedback signal. Claim 1 however calls for a delayed feedback signal and a relatively undelayed talent signal. When Tanno is configured as suggested by the examiner, the feedback signal is undelayed (the examiner notes there is no variable delay) and the talent signal is delayed (by A1, S1 and the acoustic path from S1 to M2). There is no suggestion in any of Tanno, Davidson or Kuo to combine the references as the examiner suggests to achieve the invention as claimed, however even if they are combined the problem of the delayed and undelayed signals pointed to above is not cured.

It might be noted that the examiner relies on Davidson for showing "the use of manually adjustable delays to delay a signal sufficiently to allow it to cancel an acoustically delayed version of itself" and goes to considerable length to justify the combination of Davidson with Tanno (and Kuo) to provide various

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claim elements such as variable gain, etc. Applicant believes that this combination results from impermissible hindsight reconstruction. By contrast to the examiner's combination, in the invention of the rejected claims there is no acoustic delay involved. The delays which are of concern in the instant invention result from various electronic transmission and electronic signal processing where the nature of the delays is well understood. In particular the character of the preferred embodiment video signal processing delays which give rise to the large audio delays (to prevent lip sync errors), as well as the various transmission delays, are all well known. These delays generally have well behaved group delay, frequency response and distortion characteristics, totally unlike acoustic delays which are plagued with the vagaries of physical and spatial characteristics of the acoustic environment. One of ordinary skill would not be motivated look to acoustic feedback and cancellation technology such as Umemoto, Davidson and Tanno to achieve the various elements of the claimed invention.

As just one example of the lack of motivation for one of ordinary skill to look to acoustic technology, at the top of page 11 of the office action the examiner states "[u]nless it can be guaranteed, and known ahead of time that A1 and GS1-M2 will always be constant (this is very unlikely to be the case), then clearly a variable gain adjustment must be provided for GinjT2". In fact in the broadcasting systems which the instant invention is intended to be used with, gains, once established, are usually very stable or at the most only very slowly changing. By contrast in acoustic systems the gains and delays are constantly required to change due to such factors as air movement, background noise, and even changes in physical location such as people moving about. This is a level of complexity which teaches away from the solutions of the present invention.

Claims 4-17/1 were rejected using reasoning similar to that given in the rejection above using Umemoto and Kuo. Applicant responds to this rejection incorporating the arguments given above.

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Claims 18, 42 and 48-53 were rejected under U.S.C. 103(a) as being unpatentable over Tanno, Davidson and Kuo combined as above, further considered with either of Agrawal or Umemoto, or alternatively, either of Agrawal or Umemoto considered with Davidson. Applicant responds to this rejection by incorporating the arguments given above.

RECORD OF EXAMINATION UNDER 37 C.F.R. 1.104©(2), LAST SENTENCE

The examiner has generally not disagreed with applicant's interpretation of the scope of the prior art, rather the examiner in many instances maintains rejection of the claims without providing a sufficient record of examination as provided by 37 C.F.R. 1.104. .

There is no explanation in the record as to why the examiner disagrees with applicant's position or why applicant's declaration filed 09/09/02 is insufficient – aside from blanket statements as to the lack of persuasiveness.

As just one example of the insufficient record, in the June 5, 2002 office action (paper 29) rejects various claims over Umemoto et al pointing to the claimed feedback signal shown as "[f]eedback signal (via acoustic feedback path EC)" and stating "[t]he feedback signal is, of course, provided without a variable delay circuit." On June 11, 2002, applicant pointed out that "Umemoto's feedback signal is an acoustic feedback signal, that travels through the air from the mobile telephone speaker 13 to the microphone 14" and "[t]he feedback signal of the claims is not the same feedback signal which is addressed by the Umemoto invention." Applicant provided considerable commentary showing that Umemoto's device was from a different field of art and the signal which the examiner equated to the claimed feedback signal was entirely different. Applicant also carefully explained those positions, pointed to where and how "applicant's feedback signal is particularly defined in applicant's disclosure" (along with several other claim terms) and explained why the person

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of ordinary skill would not believe that the claimed feedback signal was met by Umemoto's acoustic signal EC.

On August 28 another office action was issued, failing to address applicant's comments and merely repeated the previous rejection. It is respectfully pointed out that despite considerable arguments and points being raised by applicant, the rejection #4 starting on page 3 of the 08/28/02 office action (paper # 31). appears to be a word processor cut and paste of the rejection #4 starting on page 3 of the 06/06/02 office action (paper #29). The 08/28/02 office action then states at page 14 "[o]n page 3, line 15 to page 4 line 13, the applicant has argued that "the feedback signal of the claims is not the same feedback signal which is addressed by the Umemoto invention". The applicant's argument is not persuasive because it is not clear what the applicant means by "not the same feedback signal". This is all that is mentioned in respect to a full page of applicant's detailed discussion of the feedback signal element.

Applicant subsequently provided an 8 page request for reconsideration on 09/09/02 further explaining and pointing out this and other differences between the claim elements and prior art as well as providing a 5 page declaration in support thereof. The sole comment on applicant's request for reconsideration bringing forth in detail these matters was "see previous final rejection (paper number 31)."

The rejections given in paper 31 for the most part do not address the differences pointed to by applicant and in many instances merely state applicant's argument is not clear, or applicant's argument is moot because such limitations cannot be found in the claims. As applicant has repeatedly pointed out, claim elements such as those discussed above have specific meanings and limitations which the person of ordinary skill in the art would know from the specification. The rejections fail to use those meanings and the inherent limitations to the various claim elements, and instead give those claim elements much broader meanings which completely ignore the teachings of the specification and what is known to the person of ordinary skill. The rejections

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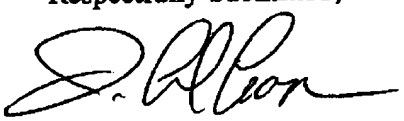
fail to state or explain why those meanings and limitations defined in the specification are not given to the various elements of the claims or why broader meanings and definitions are used. As just one example, the rejection fails to explain why the claim element "feedback signal" is considered to be so broad that it encompasses an acoustic sound (EC of Umemoto), despite Applicant having repeatedly pointed out that "feedback signal" would be known to those of ordinary skill in the art to be an electronic signal. .

For these reasons the record does not provide a sufficient record of examination as provided by 37 C.F.R. 1.104. .

In that the claims clearly distinguish over the art of record, applicant requests favorable action and remand to the examiner for timely issuance of notice of allowance.

Respectfully Submitted,



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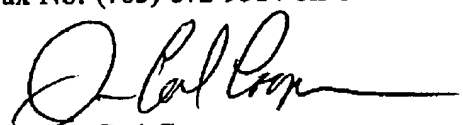

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APPENDIX

Claim 1 (twice amended) A system for providing a mix minus signal from a delayed feedback signal and a relatively undelayed talent signal including in combination:

a cancellation circuit responsive to said talent signal to delay said talent signal in a variable delay and to gain adjust said talent signal in delayed or undelayed form in a variable gain circuit thereby providing a cancellation signal, with the amount of said delay or gain responsive to human operator adjustment;

said feedback signal [without further substantial variable delay] and said cancellation signal being applied to a combining circuit to provide said mix minus signal with said feedback signal being applied without the use of a variable delay circuit.

Claim 2 (twice amended) A system for providing a mix minus signal from a delayed feedback signal and a relatively undelayed talent signal including in combination:

a cancellation circuit responsive to said talent signal to delay said talent signal in a variable delay and to gain adjust said talent signal in delayed or undelayed form in a variable gain circuit thereby providing a cancellation signal, with the amount of at least one of said delay or gain responsive to said mix minus signal or said feedback signal or both;

said feedback signal and said cancellation signal being applied to a combining circuit to provide said mix minus signal with said feedback signal being applied without the use of a variable delay circuit.

Claim 3 (twice amended) A system for providing a mix minus signal from a delayed feedback signal and a talent signal including in combination:

a cancellation circuit responsive to said talent signal to delay said talent signal in a variable delay and to gain adjust said talent signal in delayed or undelayed form in a

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variable gain circuit thereby providing a cancellation signal, with the amount of said delay and gain automatically responsive to at least one of said mix minus signal and said feedback signal and;

said feedback signal and said cancellation signal being applied to a combining circuit to provide said mix minus signal with said feedback signal being applied without the use of a variable delay circuit.

Claim 4 A system as claimed in claim 1, 2 or 3 wherein said amount of said delay is responsive to said feedback signal and the amount of said gain is responsive to said mix minus signal.

Claim 5 (twice amended) A system as claimed in claim 1, 2 or 3 wherein said amount of said delay is responsive to said mix minus signal and the amount of said gain is responsive to said feedback signal.

Claim 6 A system as claimed in claim 1, 2 or 3 wherein said amount of said delay and said amount of said gain is responsive to said feedback signal.

Claim 7 (twice amended) A system as claimed in claim 1, 2 or 3 wherein said amount of said delay and said amount of said gain is responsive to said mix minus signal.

Claim 8 A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said mix minus signal and said talent signal wherein said talent signal is in delayed form.

Claim 9 A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said feedback signal and said talent signal wherein said talent signal is in delayed form.

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Claim 10 A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said mix minus signal and said talent signal wherein said talent signal is in undelayed form.

Claim 11 A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said feedback signal and said talent signal wherein said talent signal is in undelayed form.

Claim 12 (amended) A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said mix minus signal and said talent signal wherein said talent signal has been gain adjusted in said variable gain circuit.

Claim 13 (amended) A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said feedback signal and said talent signal wherein said talent signal has been gain adjusted in said variable gain circuit.

Claim 14 (amended) A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said mix minus signal and said talent signal wherein said talent signal has been gain adjusted in said variable gain circuit.

Claim 15 (amended) A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said feedback signal and said talent signal wherein said talent signal has been gain adjusted in said variable gain circuit.

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Claim 16 A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said feedback signal and said cancellation signal.

Claim 17 A system as claimed in claim 1, 2 or 3 wherein at least one of said amount of said delay and said amount of said gain is responsive to a correlation of said mix minus signal and said cancellation signal.

Claim 18 A system as claimed in claim 1, 2 or 3 wherein said delay is automatically adjustable in response to changes in relative delay of said talent signal and the talent signal component of said feedback signal.

Claim 19 (twice amended) A system as claimed in claim 1, 2 or 3 wherein said delay is automatically adjusted in response to comparison of said feedback signal and said talent signal in undelayed form, and said gain is automatically adjusted in response to said mix minus signal and said talent signal in delayed form.

Claim 20 (twice amended) A method for providing a mix minus signal from a talent signal and a feedback signal having a variable amount of delay arising from its passage through a broadcast transmission including the steps of:

a) delaying said talent signal by a varying delay amount in response to said variable amount of delay;

b) providing a cancellation signal of a known level in response to said delayed talent signal;

c) changing said varying delay amount of said delay in step a) from time to time;

d) combining said feedback signal and said cancellation signal to provide said mix minus signal wherein said feedback signal is combined without additional variable delay beyond said variable amount.

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Claim 21 (thrice amended) A method of providing a mix minus signal from a feedback signal and a talent signal which have a variable relative timing arising from a broadcast transmission, including the steps of:

a) delaying said talent signal by a varying delay amount in response to said varying relative timing;

b) adjusting the level of said talent signal in delayed or undelayed form and providing a cancellation signal in response to the delayed form thereof;

c) in said delaying step a) or said adjusting step b) or both, changing the amount of at least one of said varying delay amount or said level in responsive to said mix minus signal or said feedback signal or both;

d) providing said mix minus signal in response to said feedback signal and said cancellation signal wherein said feedback signal receives no variable delay beyond that as part of said broadcast transmission.

Claim 22 (twice amended) A method for providing a mix minus signal from a feedback signal from a broadcast transmission and a talent signal said signals having a relative delay which may vary due to said broadcast transmission, including the steps of:

a) delaying said talent signal by an varying delay amount responsive to said relative delay which may vary;

b) adjusting the level of said talent signal in delayed or undelayed form in a variable gain circuit and providing a cancellation signal in response to the delayed version thereof;

c) wherein in step a) said varying delay amount and in step b) said level are automatically responsive to at least one of said mix minus signal and said feedback signal and;

d) providing said mix minus signal in response to said feedback signal and said cancellation signal wherein said feedback signal suffers no variable delay beyond that as part of said broadcast transmission.

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Claim 23 A method as claimed in claim 20, 21 or 22 wherein said varying delay amount of step a) is responsive to said feedback signal and said level of step b) is responsive to said mix minus signal.

Claim 24 (twice amended) A method as claimed in claim 20, 21 or 22 wherein said varying delay amount of step a) is responsive to said mix minus signal and said level of step b) is responsive to said feedback signal.

Claim 25 A method as claimed in claim 20, 21 or 22 wherein said varying delay amount of step a) and said level of step b) is responsive to said feedback signal.

Claim 26 (twice amended) A method as claimed in claim 20, 21 or 22 wherein said varying delay amount of step a) and said level of step b) is responsive to said mix minus signal.

Claim 27 A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to said talent signal in delayed form.

Claim 28 A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to a correlation of said feedback signal and said talent signal wherein said talent signal is in delayed form.

Claim 29 (twice amended) A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to said mix minus signal and said talent signal in undelayed form.

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Claim 30 A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to said feedback signal and said talent signal wherein said talent signal is in undelayed form.

Claim 31 (amended) A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to said mix minus signal and said talent signal wherein said talent signal has been gain adjusted in said step b).

Claim 32 (amended) A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to a correlation of said feedback signal and said talent signal wherein said talent signal has been gain adjusted in said step b).

Claim 33 (amended) A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to a correlation of said mix minus signal and said talent signal wherein said talent signal has been gain adjusted in said step b).

Claim 34 (amended) A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to a correlation of said feedback signal and said talent signal wherein said talent signal has been gain adjusted in said step b).

Claim 35 A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to a correlation of said feedback signal and said cancellation signal.

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Claim 36 A method as claimed in claim 20, 21 or 22 wherein at least one of said varying delay amount of step a) and said level of step b) is responsive to a correlation of said mix minus signal and said cancellation signal.

Claim 37 A method as claimed in claim 20, 21 or 22 wherein said varying delay amount of step a) is automatically adjustable in response to changes in relative delay of said talent signal and the talent signal component of said feedback signal.

Claim 38 (twice amended) A method as claimed in claim 20, 21 or 22 wherein said varying delay amount of step a) is automatically adjusted in response to comparison of said feedback signal and said talent signal in undelayed form, and said level of step b) is automatically adjusted in response to said mix minus signal and said talent signal in delayed form.

Claim 39 A method as claimed in claim 20, 21 or 22 wherein said delaying of step a) include pitch correction in order that the pitch of said talent signal remains constant as said delay is changed.

Claim 40 (amended) A system for providing a mix minus signal from a feedback signal having a relative delay with respect to a talent signal including in combination:

a cancellation circuit responsive to said talent signal to delay said talent signal in an amount set by a human operator and to gain adjust said talent signal in delayed or undelayed form in a variable gain circuit thereby providing a cancellation signal and;

a combining circuit responsive to said feedback signal and said cancellation signal to provide said mix minus signal.

Claim 41 (amended) A system as in claim 40 wherein said gain adjustment of said talent signal operates in a fashion such that said mix minus signal intentionally includes an audible residual amount of said talent signal.

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Claim 42 (amended) A system as in claim 40 wherein said delay amount of said talent signal is automatically changed from said amount set by a human operator to the expected amount of said relative delay of said feedback signal with respect to said talent signal when said relative delay changes.

Claim 43 (amended) A system for providing a mix minus signal from a feedback signal delayed by a first amount relative to a talent signal including in combination:

a cancellation circuit responsive to said talent signal to delay said talent signal by an amount set by a human operator to the expected value of said first amount and to gain adjust said talent signal in delayed or undelayed form in a variable gain circuit thereby providing a cancellation signal and;

a combining circuit responsive to said feedback signal and said cancellation signal to provide said mix minus signal.

Claim 44 (amended) A system for providing a mix minus signal from a feedback signal delayed by a first amount relative to a talent signal including in combination:

a cancellation circuit responsive to said talent signal to delay said talent signal by an amount set by a human operator in response to the expected value of said first amount and to gain adjust said talent signal in delayed or undelayed form in a variable gain circuit thereby providing a cancellation signal, with the amount of said gain responsive to said mix minus signal or said feedback signal or both and;

a combining circuit responsive to said feedback signal and said cancellation signal to provide said mix minus signal.

Claim 45 (amended) A system as in claim 43 or 44 wherein said mix minus signal intentionally includes an audible residual amount of said talent signal which amount is responsive to human operator adjustment.

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Claim 46 (amended) A method of providing a mix minus signal from a feedback signal which is delayed by a first amount and a talent signal [have a variable relative timing,] including the steps of:

a) delaying said talent signal by an amount set by a human operator in response to the expected value of said first amount;

b) adjusting the level of said talent signal in delayed or undelayed form and providing a cancellation signal in response to the delayed form thereof and;

c) providing said mix minus signal in response to said feedback signal and said cancellation signal.

Claim 47 (amended) A method as in claim 46 wherein step b) or c) or both operate in a fashion such that said mix minus signal intentionally includes a residual audible amount of said talent signal.

Claim 48 (amended) A method as in claim 46 wherein step a) includes automatically changing the amount of delay of said talent signal from said amount set by said human operator to said first amount.

Claim 49 (amended) A method for providing a mix minus signal from a feedback signal delayed by a first amount and a talent signal including the steps of:

a) delaying said talent signal by an amount set by a human operator in response[iv]e to the expected value of said first amount;

b) adjusting the level of said talent signal in delayed or undelayed form in a variable gain circuit and providing a cancellation signal in response to the delayed version thereof;

c) automatically varying said delay amount of step a) from said expected value to said first value and;

d) providing said mix minus signal in response to said feedback signal and said cancellation signal.

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Claim 50 (amended) A method of providing a mix minus signal from a feedback signal delayed by a first amount and a talent signal including the steps of:

a) delaying said talent signal by a delay amount set by a human operator in response to the expected value of said first amount;

b) adjusting the level of said talent signal in delayed or undelayed form and providing a cancellation signal in response to the delayed form thereof;

c) in said delaying step a) or said adjusting step b) or both, automatically changing the amount of at least one of said delay amount or said level in responsive to at least one of said mix minus signal or said feedback signal and;

d) providing said mix minus signal in response to said feedback signal and said cancellation signal.

Claim 51 A method as in claim 49 or 50 wherein said mix minus signal intentionally includes a residual audible amount of said talent signal which amount is responsive to human operator adjustment.

Claim 52 A method as in claim 49 or 50 wherein in step c) includes automatically changing the amount of delay of said talent signal from said amount set by said human operator to said first amount after said delay of step a) is set by said human operator.

Claim 53 A method as in claim 49 or 50 wherein in step c) includes automatically changing the amount of delay of said talent signal from said amount set by said human operator to match said first amount in response to changes in said first amount.

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